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LET'S CLEAR THE AIR

Public Health Service,
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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Public Health Service

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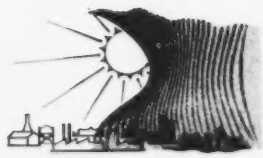


PUBLIC HEALTH SERVICE PUBLICATION NO. 1238

LET'S CLEAR THE AIR

It is a pleasure to welcome you to this national conference and to thank you for devoting 3 days of your time to the problem of air pollution. Between now and next Wednesday evening you will be called upon in plenary and panel sessions to grapple with the many diversified and complicated issues associated with air pollution. The extent to which you suceed in clarifying these complexities will determine how close we come to achieving our deceptively simple conference objective, "Let's Clear the Air."

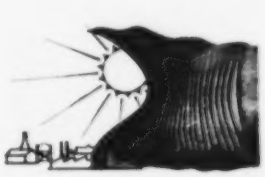
By the end of our sessions on Wednesday we shall not have achieved a miracle. The filters of air-sampling devices throughout the country will still come out in varying shades of dreary gray and deepest black. Nevertheless, if we keep sight of our objective and help clear the air of many unresolved issues that cloud the problem, a favorable change in air-sampling results will follow in due time. That, after all, is why we are here.

Air is the medium on which all human activity depends. It is not surprising, then, that the adverse effects of air pollution are many and varied. Moreover, virtually everyone is responsible to one degree or another for the problem. These are the characteristics which mark air pollution as a prime problem of the contemporary environment and account for the fact that we represent such a wide range of interests, organizations, and professional disciplines.

Many of you who are here today contributed to the remarkably successful Conference on Air Pollution held in 1958. Why then, if that conference was successful, are we holding another now? What have been our accomplishments since then? Which problems remain the same? Which are different? And what are our needs for the future?

Certainly the fundamental facts of life in a nation of advanced technology, which faced us in 1958, are still with us today. There are no signs on the horizon to suggest that man's capacity for fouling his nest has lessened. Indeed, there have been signs of an ever-growing capacity to produce—by chance or by choice—dramatic alterations in the conditions of human life. Urbanization continues; the great demands for more products, services, and energy continue; the mechanization and automation of many human activities grow.

Beneath all these manifestations of change, in fact, the very root from which they grow and flower, is an ever-increasing proliferation of scientific knowledge. It is this knowledge which enables us with an ever more subtle certainty to chart the far-ranging course of satellites in space and—at the other end of the scientific spectrum—to map the genes on a chromosome. Yet today, as in 1958, many of the problems of how to employ this burgeoning scientific knowledge within the context of the social, economic, and political framework of our society continue to confound us.



We are so sophisticated scientifically that men can breathe in the airless void beyond the earth's atmosphere. And yet we are so primitive that the quality of the air we breathe on the surface of the earth continues to deteriorate.

Since it is our task to help rectify such incongruities, our work is bound to be difficult. Real solutions to the problem of air pollution will require an enlargment of our vision and the serious contemplation of the other side of a lot of old coins whose one side we have long been accustomed to. We must address ourselves to the entire problem in all of its staggering breadth and scope and not confine ourselves to its undeniably important, but essentially noncontroversial, technical aspects. We must place at least equal emphasis on how to apply what we already know.

PROBLEM GROWING WORSE

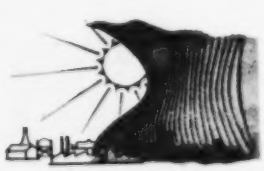
Air moves or doesn't move as natural forces dictate. The artificial lines we place on our maps do not trammel it. And the dozens of jurisdictions into which we fragment our metropolitan areas trouble the air not at all. What troubles the air is the burden of pollutants we ask it to carry. This burden promises to become greater, ironically, in direct proportion to our success in increasing our general prosperity.

The trends of technological growth assure us in advance that smoke and fumes, dusts and gases, will move into the air from more points on the urban scene. Growth of the air pollution problem, therefore, is automatic—no study is required, no committee meetings, no compromises—not a harsh word nor a single glimpse at a point of view that has not already worn comforting grooves in our consciousness. The control of air pollution, on the other hand, is in no way automatic, and there is no advance assurance that our efforts to deal with the problem will be adequate. These efforts must be deliberately and conscientiously planned.

During the next 3 days virtually every important health, economic, and social aspect of the air pollution problem will be the subject of expert discussion. When the discussions are over we should be in a better position to determine precisely where we stand.

Today, however, we begin our appraisal from a more advanced vantage point than had been reached 4 years ago.

THREAT TO HEALTH



Our knowledge of the health effects of air pollution has been amplified considerably through three types of investigations: statistical studies of past illness and death as correlated with geographic locations and other factors associated with air pollution; epidemiological studies of death and respiratory function as related to variations in air pollution; and laboratory studies of

responses by animals, and in some cases by human beings, to exposure to various pollutants or combinations of pollutants.

This is not the occasion to recapitulate all of the investigations that have been conducted. A thorough review of health studies related to air pollution will no doubt occur tomorrow in the panel sessions. However, I should like to highlight briefly just a few of the investigations which have augmented our store of knowledge.

Studies have shown that death rates for cardiorespiratory causes correlate in general with air pollution levels; that asthmatic attacks among susceptible patients correlate with variations in sulfate air pollution in Nashville, and that asthma attacks in New Orleans may be associated with air pollution resulting from the incomplete combustion of refuse. Employee absenteeism due to respiratory illness has been correlated with levels of sulfate pollution. Another study demonstrates that people living in a town where pollution is high display significant differences in average airway resistance when compared with those living in a town where pollution is lower. It has been brought to light that more than 200 excess deaths occurred in New York City in 1953 during a period of air stagnation.

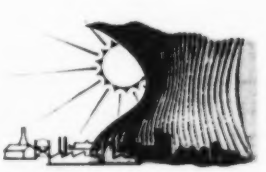
Laboratory studies involving exposure of animals and, in some cases, human beings to controlled concentrations of gaseous pollutants, such as ozone and sulfur dioxide, agree generally with the results of epidemiological studies. One of the most significant investigations of this type resulted in the development of lung cancer among laboratory animals infected with influenza virus and later exposed to the inhalation of an artificial smog consisting of ozonized gasoline. Mice exposed to either influenza or ozonized gasoline singly did not develop lung cancer.

These are but a few of the highlights of health investigations carried out in the past few years. There have been many others and, when combined with past studies on the subject, they form a considerable body of evidence which makes it unmistakably clear that air pollution is associated with such important respiratory diseases as lung cancer, emphysema, chronic bronchitis, and asthma.

What does this association mean? Does it mean that air pollution causes these diseases? If not, is there nothing to fear from air pollution as a public health problem?

Before these questions can be adequately answered, it is necessary to examine what is meant by the term "cause" when we speak of the chronic diseases associated with air pollution.

I submit that much of the speculation and controversy about whether or not air pollution causes disease is irrelevant to the significance of air pollution as a public health hazard. We are accustomed to thinking that a disease state is brought about by a single cause—a carryover from a period in public health history when virtually total emphasis was placed on *the* bacterial or viral agent which had to be present before a communicable disease could be recognized and dealt with. That there is frequently a



simple association between an infectious disease agent and the acute disease reaction which it provokes was once a startling revelation. And in public health it has served us well and continues to serve us well. But we have learned that it is not the master key that unlocks all the secrets of disease and health. The idea that one factor is wholly responsible for any one illness is patently too simple to provide all the answers we need to deal with the chronic diseases which are on the rise today.

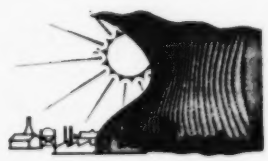
Chronic bronchitis, which in Great Britain is established as a specific disease entity, is a good example. It develops over a long period of time and can become crippling through a combination of many factors—air pollution, smoking, repeated and recurring bouts with infectious agents, occupational exposures—all affected, perhaps, by an hereditary predisposition. What then is *the* cause of chronic bronchitis? The answer is obvious. There is probably no single cause, but there is sufficient evidence that air pollution can and does contribute to its development. This is what really matters, whether we choose to consider it *the* cause, one of several causes, or simply a contributing factor.

New criteria must be employed in assessing the damage of air pollution—criteria which include statistical evidence that a disease condition exists in a population, epidemiological evidence of the association between the disease and the environmental factor of air pollution, reinforced by laboratory demonstration that the air pollutants can produce similar diseases in experimental subjects. Ideally, all of these observations should be underlined by the ultimate demonstration that protection against air pollution will lessen or remove the severity of the disease.

There are still great deficiencies in our knowledge. We need to learn more about the pollutants which affect health—and in what amounts and under which conditions. But the qualitative evidence at hand conveys a clear message. *There is no longer any doubt that air pollution is a hazard to health*—the entire complicated and often misconstrued question of "cause" notwithstanding.

AN ECONOMIC BURDEN

In addition to its effects on health, air pollution places a heavy economic burden on the country. It causes extensive damages through its effects on animal and plant life, through corrosion and soiling of materials and structures, depreciation of property values, interference with air and surface transportation through reduction in visibility, and losses of unburnt fuel. These matters, too, will be discussed in depth in the next 3 days. I would say simply that estimates of such losses have tended to increase in recent years. The latest figures suggest that air pollution may be costing the Nation more than $7 billion each year.



Because the economic and health effects of air pollution are

related in a number of important ways, our efforts are not, and cannot be, confined to health effects alone.

FEDERAL ACTIVITIES

New and valuable information on levels of air pollution throughout the Nation are being made available through the cooperative local, State, and Federal National Air Sampling Network which now operates in every State, in 213 urban and 37 nonurban sampling sites. In addition, we now have a Continuous Air Monitoring Program which provides what is virtually a minute-by-minute appraisal of the levels of gaseous pollutants in nine major cities.

A 2-year study on auto exhaust and health has been completed under Public Law 86–493, passed in 1960. The report to Congress, "Motor Vehicles, Air Pollution, and Health," makes clear that research has shown that automobile emissions do produce adverse effects on human health and other biological systems. It points out that it is possible that none of our present approaches will, in the long run, provide adequate solutions to the problem. Entirely different concepts may be needed, such as the modification of basic engine design or employment of types of engines not now commonly in use.

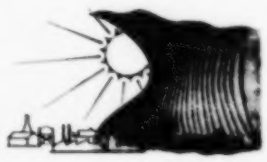
We have made progress in assessing the quantities of individual pollutants present in the atmosphere. An example is the number of studies published on comparative levels of benzpyrene in cities throughout the country.

We have accelerated our work on the investigations of techniques and basic design considerations, not only as they relate to the pollutants produced by automobiles, but also for other ubiquitous pollutants, such as the oxides of sulfur, for which adequate means of control are not now available.

We have stepped up technical assistance activities. We have completed 13 cooperative statewide surveys as well as 10 major local surveys and dozens of investigations of special air pollution problems.

We have augmented our training efforts. Up to the present, training at the Public Health Service's Sanitary Engineering Center in Cincinnati and in the field includes courses in 18 different subject areas. Research and training grants to universities and other organizations have increased from 31 in 1958 to 85 at the present time.

In a number of ways we have lent assistance to the State of California, which has taken unprecedented steps toward the control of air pollution. California has established the first statewide health standards for pollutants in community atmosphere and has greatly stimulated the development of control devices for automobiles. Among these is the crankcase ventilation, or blowby device, which is offered voluntarily by automobile manufacturers as standard equipment on all new American cars now available.



In addition, California legal requirements have stimulated the development of devices to control the major source of pollution from automobiles, engine exhaust fumes emitted through the tailpipe.

I have pointed out only a few of the landmarks of progress over the past few years. There are many others. They add up to a valuable harvest of information on the effects of air pollution on man, on agriculture, and on our economy.

Federal activities in air pollution are guided by the basic concept that the Federal role should be one of providing leadership and assistance toward obtaining the common objective of cleaner air, in cooperation with all other levels of government, industry, and other interested elements of our society. All of our activities are designed essentially to support State and local governments, which have the primary responsibility for the control of air pollution. The extent to which industrial and other organizations, and individuals, control the pollution for which they are responsible depends directly on the effectiveness of State and local programs.

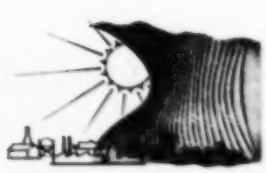
INADEQUATE CONTROL EFFORTS

The number and effectiveness of these programs provide the best yardstick by which we can measure our success, or lack of it, in translating our growing knowledge into concrete action.

A glance at this yardstick shows how far we have yet to go. Approximately 90 percent of the urban population live in localities with air pollution problems—a total of about 6,000 communities. But only half of this population is served by local control programs with full-time staffs. There are now about 100 such programs, serving 342 local political jurisdictions. The median annual expenditure is about 10 cents per capita, an amount clearly inadequate to do the job which is necessary.

During the past decade there has been some improvement in the status of State air pollution legislation and in the development of comprehensive programs. About 15 States now authorize the conduct of specific programs, whereas no State had such authorization in 1950. These relatively new air pollution programs are quite variable with respect to their activities, and most operate under severe budgetary restrictions.

If we are going to clear the air, then, it is particularly important that State and local air pollution control programs be extended in coverage and strengthened in depth.



We can assist through an expanded program at the Federal level. We could then provide better appraisals of the present and potential air pollution problems in specific localities. We need improved methods and instrumentation for recording emissions and determining atmospheric levels of pollutants and their effects. We need to help develop administrative procedures

which will be useful in resolving interjurisdictional problems.

In addition, it may well be that new means are needed to stimulate the development, improvement, and extension of local air pollution control programs. One which has served well in other areas of health is financial stimulation by means of grants for specific local and State projects.

RISING PUBLIC CONCERN

In the long run, the view the public takes of air pollution will determine the extent to which all of us—in government, industry, and elsewhere—meet our obligations in this area. Precisely how the public feels about air pollution is a very subjective matter and is not easy to gage. Yet there are several discernible signs of growing public interest.

The concern shown in recent years by scientific, civic, and social organizations, for example, is objective evidence of this interest. Some groups have long been involved with the problem; others have moved into the field since the last national conference was held. Their number and diversity are reflections not only of widespread public interest but of the many ramifications of the air pollution problem.

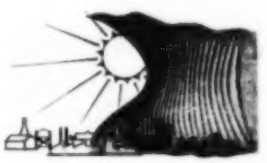
Of no less importance is the fact that information on air pollution has been made both more accessible and more understandable to the layman as well as to the expert through greatly augmented attention by the public media—newspapers, radio and television, and periodicals. Air pollution has, in short, become a part of the public consciousness.

This evidence of broad awareness represents progress just as surely as do new research and control developments. Our most important task at this conference is to find ways of channeling the knowledge we have and the interest we have observed into creative programs of action.

THE GREAT CHALLENGE

The challenge is great, for the problem of air pollution is an inseparable part of one of the most important needs of our time: the creation, in our era of accelerating change, of a healthful environment worthy of our high level of economic development and scientific achievement.

There are those who feel that our age and our country no longer offer new challenges. They somehow see in urbanization and the loss of our geographic frontiers an automatic loss of the spirit of adventure. Some would equate the fact that you cannot drive a herd of cattle from Cheyenne to Dodge City without using wire cutters with an irretrievable loss of liberty and self-determination.

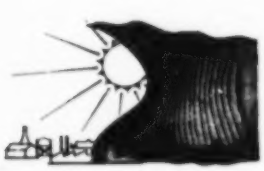


I cannot accept this point of view. The horizons of American life were never more challenging, the adventures never more exciting, nor potentially more rewarding. We have a new frontier to conquer. I refer neither to our vanished Western frontier, of which the cowboy is still an enduring symbol, nor to the new frontier of interplanetary space symbolized by the spaceman. I refer rather to the frontier which can be conquered only through the creation of a physical, social, and cultural environment in which people can achieve the highest possible levels of health—an environment in which, to paraphrase a famous statement by William Faulkner, mankind may prevail, not merely survive. This challenge offers opportunities for adventure second to none in importance, and will benefit millions of people alive and more millions yet unborn. Even after it has become commonplace to stand on the moon breathing smog-free air under an artificial canopy, people will still need to find their essential fulfillment here on earth.

To achieve this kind of environment we must take full cognizance of the great acceleration in scientific accomplishment which has attained so fantastic an impetus in recent generations. A decade now brings changes demanding much greater adaptations in our habits of body and mind than a millennium did during the vastly greater portion of man's existence on earth. We cannot confine our great accomplishments to the calm and dispassionate atmosphere of the laboratory. We must move out, into the sun and the smog, where ugliness blights our fairest cities; where rivers which once moved clear and blue are now laden with filth; where traffic stands still and there is no place to walk; where chronic diseases continue to rise in an era of unparalleled affluence; and where health is still regarded, by and large, as a negative condition in which there is an apparent absence of pain or disability.

WE ARE RESPONSIBLE

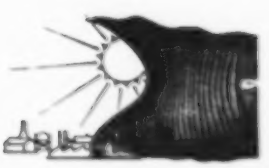
Since modern man can determine the nature of his environment, he must learn to accept responsibility for its deficiencies in much the same way that he accepts responsibility for his individual acts. Otherwise, our repeated pleas for cooperative effort and shared responsibility have a hollow sound. If a crime is committed, we are quick to bring the immense weight of civilization to bear upon the guilty one, but what about the crimes that we commit as a group? These are offenses we commit against ourselves—often in good faith and with the most highly sanctioned of motives.



From this point of view, Donora was a crime. The deaths from chronic diseases associated with environmental factors which occur daily are also crimes. Who is to blame? Where are the culprits? What should we do to apprehend them? Where?

Everywhere. *We are all guilty—not health officials alone, nor legislators, nor businessmen—but all of us.*

Certainly now, when we can and do determine—by chance or by choice—the structure of our environment, we cannot blame the vagaries of nature for its defects. That time is past. *We* are responsible. During the next 3 days we have an opportunity to discharge an important part of our awesome responsibility. Let's get on with it! *Let's clear the air!*



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